(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 12 February 2004 (12.02.2004)

PCT

(10) International Publication Number WO 2004/013868 A3

(51) International Patent Classification⁷: H01B 7/20, 12/12, 11/06, H01L 39/14

(21) International Application Number:

PCT/US2003/024290

(22) International Filing Date: 1 August 2003 (01.08.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 60/400,429

1 August 2002 (01.08.2002) US

(71) Applicant (for all designated States except US): SOUTH-WIRE COMPANY [US/US]; P.O. Box 1000, One Southwire Drive, Carrollton, GA 30119 (US).

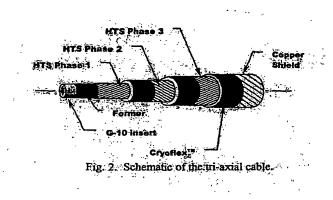
(72) Inventors; and

(75) Inventors/Applicants (for US only): GOUGE, Michael, J. [US/US]; Oak Ridge National Laboratory, Y-12 Plant, Bear Creek Road, P.O. Box 2009, MS 8071, Oak Ridge, TN 37831 (US). FISHER, Paul, W. [US/US]; Oak Ridge National Laboratory, Y-12 Plant, Bear Creek Road, P.O. Box 2009, MS8071, Oak Ridge, TN 37831 (US). FOSTER, C., A. [US/US]; Oak Ridge National Laboratory, Y-12 Plant, Bear Creek Road, P.O. Box 2009, MS8071, Oak Ridge, TN 37831 (US). COLE, M., J. [US/US]; Oak Ridge National Laboratory, Y-12 Plant, Bear Creek Road, P.O. Box 2009, MS8071, Oak Ridge, TN 37831 (US). LINDSAY, David, L. [US/US]; 110 Victoria Vinings, Carrollton, GA 30116 (US).

- (74) Agents: HANEGAN, Herbert, M. et al.; Smith, Gambrell & Russell, LLP, Suite 3100, Promenade II, 1230 Peachtree Street, N.E., Atlanta, GA 30309-3592 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: TRIAXIAL SUPERCONDUCTING CABLE AND TERMINATION THEREFOR



Schematic of the tri-axial cable

(57) Abstract: In order to provide a flexible oxide superconducting cable which is reduced in AC loss, tape-shaped superconducting wires covered with a stabilizing metal are wound on a flexible former. The superconducting wires are preferably laid on the former at a bending strain of not more than 0.2 %. In laying on the former, a number of tape-shaped superconducting wires are laid on a core member in a side-by-side manner, to form a first layer. A prescribed number of tape-shaped superconducting wires are laid on top of the first layer in a side-by-side manner, to form a second layer. The former may be made of a metal, plastic, reinforced plastic, polymer, or a composite and provides flexibility to the superconducting wires and the cable formed therewith. Methods of forming and terminating a triaxial superconductor are disclosed.



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

- of inventorship (Rule 4.17(iv)) for US only

Published:

with international search report

- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 15 April 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.









INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/24290

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : H01B 7/20, 11/06, 12/12; H01L 39/14					
US CL : 174/120 SC, 106 SC, 102 SC, 105 SC, 15;5; 333/1, 12					
According to International Patent Classification (IPC) or to both national classification and IPC					
B. FIELDS SEARCHED					
Minimum documentation searched (classification system followed by classification symbols) U.S.: 174/120 SC, 106 SC, 102 SC, 105 SC, 15.5; 333/1, 12					
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched NONE					
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) NONE					
C. DOCUMENTS CONSIDERED TO BE RELEVANT					
Category *	Citation of document, with indication, where appropriate, of the relevant passages			Relevant to claim No.	
Y	US 3,843,830 A (PRIAROGGIA et al.) 22 October 1974 (22.10.1974), see entire document.			1-19	
Y	US 6,225,565 B1 (PRYSNER) 01 May 2001 (01.05.2001), see entire document.			1-19	
Y	US 5,932,523 A (FUJIKAMI et al.) 03 August 1999 (03.08.1999), see entire document.			1-19	
	,				
	<u></u>	•	•		
Further	documents are listed in the continuation of Box C.		See patent family annex.		
Special categories of cited documents:		"T"	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention		
"A" document defining the general state of the art which is not considered to be of particular relevance					
"E" earlier ap	earlier application or patent published on or after the international filing date		"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive when the document is taken alone		
	t which may throw doubts on priority claim(s) or which is cited to				
establish specified)	the publication date of another citation or other special reason (as	"Y"	document of particular relevance; the considered to involve an inventive step		
	t referring to an oral disclosure, use, exhibition or other means	combined with one or more other such documents, such combination being obvious to a person skilled in the art			
"P" document published prior to the international filing date but later than the priority date claimed		"&" document member of the same patent family			
Date of the actual completion of the international search D			mailing of the international spri	h ###D 200#	
07 November 2003 (07.11.2003)				r MAK SOA	
Name and mailing address of the ISA/US			Authorized officer		
Mail Stop PCT, Attn: ISA/US Commissioner for Patents			David S Martin Sharm J. Apple		
P.O. Box 1450			2 di la constanti di la consta		
Alexandria, Virginia 22313-1450 Facsimile No. (703) 308-3121 Telephone No. (703) 308-3121					
Facsimile No. (703)305-3230					

Form PCT/ISA/210 (second sheet) (July 1998)